WHAT IS CLAIMED:

1. A fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, including:

a step of obtaining a number of two-dimensional image data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the two-dimensional image data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of defining the arrangement of the three-dimensional object defined in the above step, a hologram plane, and a reference beam to compute interference fringes on the hologram plane; and

a step of recording the interference fringes computed in the above step onto a recording medium.

2. A fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in claim 1, wherein said two-dimensional image data of the

three-dimensional object are obtained by an X-ray CT, an MRI, or a TEM.

3. A fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, including:

a step of obtaining volume data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the volume data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of defining the arrangement of the three-dimensional object defined in the above step, a hologram plane, and a reference beam to compute interference fringes on the hologram plane; and

a step of recording the interference fringes computed in the above step onto a recording medium.

4. A fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed

in claim 3, wherein said volume data of the three-dimensional object are obtained by an X-ray CT, an MRI, or a TEM.

5. A computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, wherein the computer-generated hologram is fabricated by a fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in any one of claims 1 through 4.

6. A computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, wherein one or more computer-generated holograms, in which a three-dimensional object which is cut along a given cross section and of which cross-sectional surfaces on the cross section are visualized is reconstructably recorded, and a computer-generated hologram, in which the three-dimensional object before cut is reconstructably recorded, are superposed and recorded as a single computer-generated hologram.

7. A computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in claim 6, wherein the three-dimensional object is recorded such that three-dimensional objects to be reconstructed from the respective computer-generated holograms are multiplexed and recorded to have the same relative positions therebetween.

8. A printed matter with a computer-generated hologram attached at a predetermined position thereof, the computer-generated hologram being fabricated by a fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, the method including:

a step of obtaining a number of two-dimensional image data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the two-dimensional image data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of defining the arrangement of the three-dimensional object defined in the above step, a hologram plane, and a reference beam to compute interference fringes on the hologram plane; and

a step of recording the interference fringes computed in the above step onto a recording medium.

9. A printed matter with a computer-generated hologram

attached at a predetermined position thereof, the computer-generated hologram being fabricated by a fabrication method for a computer-generated hologram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, the method including:

a step of obtaining volume data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the volume data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of defining the arrangement of the three-dimensional object defined in the above step, a hologram plane, and a reference beam to compute interference fringes on the hologram plane; and

a step of recording the interference fringes computed in the above step onto a recording medium.

10. A fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, including:

a step of obtaining a number of two-dimensional image data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the two-dimensional image data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of producing a plurality of two-dimensional original images as observed in different observing directions from the three-dimensional object defined in the above step; and

a step of recording element holograms relating to said two-dimensional original images to positions on a hologram plane corresponding to the observing directions, respectively, such that the two-dimensional original images are arranged in one-dimensional direction or in two-dimensional directions.

11. A fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in claim 10,

wherein said two-dimensional image data of the three-dimensional object are obtained by an X-ray CT, an MRI, or a TEM.

12. A fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, including:

a step of obtaining volume data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the volume data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of producing a plurality of two-dimensional original images as observed in different observing directions from the three-dimensional object defined in the above step; and

a step of recording element holograms relating to said two-dimensional original images to positions on a hologram plane corresponding to the observing directions, respectively, such that the two-dimensional original images

are arranged in one-dimensional direction or in two-dimensional directions.

13. A fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in claim 12, wherein said volume data of the three-dimensional object are obtained by an X-ray CT, an MRI, or a TEM.

14. A holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, wherein the holographic stereogram is fabricated by a fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded as claimed in any one of claims 11 through 13.

15. A printed matter with a holographic stereogram attached at a predetermined position thereof, the holographic stereogram being fabricated by a fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, the method including:

a step of obtaining a number of two-dimensional image data of a three-dimensional object;

a step of producing three-dimensional image data composed only of surface data of the three-dimensional object from the two-dimensional image data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of producing a plurality of two-dimensional original images as observed in different observing directions from the three-dimensional object defined in the above step; and

a step of recording element holograms relating to said two-dimensional original images to positions on a hologram plane corresponding to the observing directions, respectively, such that the two-dimensional original images are arranged in one-dimensional direction or in two-dimensional directions.

16. A printed matter with a holographic stereogram attached at a predetermined position thereof, the holographic stereogram being fabricated by a fabrication method for a holographic stereogram in which a three-dimensional object having visualized cross-sectional surfaces is recorded, the method including:

a step of obtaining volume data of a three-dimensional object;

a step of producing three-dimensional image data

composed only of surface data of the three-dimensional object from the volume data obtained in the above step;

a step of cutting the three-dimensional object composed only of the surface data produced in the above step along a predetermined cross section;

a step of defining the shape of the three-dimensional object to be recorded in a hologram by adding surface data representing cross-sectional surfaces on the cut cross section to the same;

a step of producing a plurality of two-dimensional original images as observed in different observing directions from the three-dimensional object defined in the above step; and

a step of recording element holograms relating to said two-dimensional original images to positions on a hologram plane corresponding to the observing directions, respectively, such that the two-dimensional original images are arranged in one-dimensional direction or in two-dimensional directions.